Patent Claims

1. Synthetic particle formed from at least one nucleic acid sequence or nucleic acid derivative sequence and one protein having a molecular weight in the range from 3900 to 4300.

2. Synthetic particle according to Claim 1, where the protein consists predominantly of arginine.

3. Synthetic particle according to Claim 1 or 2, where the protein is selected from the following group: protamine, protamine base, protamine derivatives or salts, preferably protamine sulfate or protamine chloride.

4. Synthetic particle according to any of the preceding claims, where the nucleic acid sequence is in single-stranded form.

5. Synthetic particle according to any of the preceding claims, where the nucleic acid sequence is an oligonucleotide or a derivative thereof.

6. Synthetic particle according to any of the preceding claims, where the oligonucleotide consists of at least 5 nucleotides.

7. Synthetic particle according to any of the preceding claims, where the derivative is a phosphorothioate or an anionic derivative.

8. Synthetic particle according to any of the preceding claims, where the average diameter of the particle is in the range from 10 nm to 100 µm.

9. Synthetic particle according to any of the preceding claims, where the particle carries a surface electric charge.

10. Synthetic particle according to any of the preceding claims, where the surface charge is in the range from -40 mV to +40 mV.

11. Process for the preparation of synthetic particles according to any of the preceding claims, with the following steps:

a) preparation of an aqueous first solution containing a protein having a molecular weight in the range from 3900 to 4300,

b) addition to the first solution of a second solution containing a nucleic acid sequence or nucleic acid derivative sequence and

c) mixing of the first and second solution.

12. Process according to Claim 11, where the first and the second solution are free of salts.

13. Process according to either of Claims 11 or 12, where the molar ratio of nucleic acid sequence or nucleic acid derivative sequence to protein is adjusted to produce a predetermined surface charge.

14. Process according to any of Claims 11 to 13, where the protein consists predominantly of arginine.

15. Process according to any of Claims 11 to 14, where the protein is selected from the following group: protamine, protamine base, protamine derivatives

or salts, preferably protamine sulfate or protamine chloride.

16. Process according to Claim 15, where protamine, protamine base, protamine derivatives are obtained from salmon sperm.

17. Process according to any of Claims 11 to 16, where the nucleic acid sequence is in single-stranded form.

18. Process according to Claim 17, where the nucleic acid sequence is an oligonucleotide or a derivative thereof.

19. Process according to Claim 18, where the oligonucleotide consists of at least 5 nucleotides.

20. Process according to any of Claims 17 to 19, where the derivative is a phosphorothioate or an anionic derivative.

21. Process according to any of Claims 11 to 20, where the diameter of the particle is in the range from 10 nm to 100 µm.

22. Process according to any of Claims 11 to 21, where the particle carries a surface electric charge.

23. Process according to any of Claims 9 to 22, where the surface charge is in the range from -40 mV to +40 mV.

24. Use of a protein having a molecular weight in the range from 3900 to 4300 for the preparation of a synthetic particle containing at least one nucleic acid sequence or nucleic acid derivative sequence.

25. Use according to Claim 24, where the protein consists predominantly of arginine.

26. Use according to Claim 24 or 25, where the protein is selected from the following group: protamine, protamine base, protamine derivatives or salts, preferably protamine sulfate or protamine chloride.

27. Use according to any of Claims 24 to 26, where the nucleic acid is an oligonucleotide which is preferably single stranded and preferably consists of at least 5 nucleotides, or a derivative thereof which is preferably in the form of a phosphorothioate.